

Notice of Allowability

Application No.

10/064,254

Examiner

Leonard S Liang

Applicant(s)

CHOU ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed on 02/06/04.
2. ☒ The allowed claim(s) is/are 1,9,10,16-18 and 21-43.
3. ☒ The drawings filed on 18 July 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 01/12/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Stephen D. Meier
Primary Examiner

DETAILED ACTION

Allowable Subject Matter

Claims 1, 9-10, 16-18, and 21-43 are allowed.

The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claims 1, 9-10 is the inclusion of the limitations of "at least three distinct heaters electrically connected to a driving circuit and disposed at a first side of the orifice and a second side of the orifice, at least two of the heaters disposed at one of either the first side or the second side, and at least one of the heaters disposed at the other of the first side and the second side, the driving circuit driving the heater(s) disposed at the first side to heat fluid to generate a first bubble in a corresponding chamber and driving the heater(s) disposed at the second side to heat fluid to generate a second bubble in the corresponding chamber; wherein each heater disposed at either the first side or the second side is connected in series to one of the heater(s) disposed at the other side, wherein the driving circuit is capable of independently driving or simultaneously driving each heater disposed on the same side of the orifice along with the corresponding heaters disposed on the other side of the orifice that are serially connected to the driven heaters; wherein the driving circuit drives the heaters selectively so that each of the nozzles is capable of ejecting droplets of different sizes." It is these limitations found in each of the claims, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 16-18 and 21-33 is the inclusion of the limitation of "wherein the first bubble generator group and the second bubble generator group

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together comprise at least three distinct bubble generators, the first bubble generator group or the second bubble generator group comprises at least two independently drivable bubble generators for generating the first bubble or the second bubble, and the other of the first bubble generator group or the second bubble generator group comprises at least one distinct bubble generator.” It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which, makes these claims allowable over the prior art.

The primary reason for the allowance of claims 34-42 is the inclusion of the limitation of “wherein a number of bubble generators in the first bubble generator group is different from a number of bubble generators in the second bubble generator group.” It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which, makes these claims allowable over the prior art.

The primary reason for the allowance of claim 43 is the inclusion of the limitations of “two heaters electrically connected to a driving circuit and disposed at a first side of the orifice and one heater electrically connected to the driving circuit and disposed at a second side of the orifice, the driving circuit driving the two heaters disposed at the first side to heat fluid to generate a first bubble in a corresponding chamber and driving the heater disposed at the second side to heat fluid to generate a second bubble in the corresponding chamber; wherein each of the heaters disposed on the first side is connected in series to the heater disposed on the second side, the driving circuit is capable of simultaneously driving the two heaters disposed on the first side along with the heater disposed on the second side to generate the first and second bubbles, and the driving circuit is capable of driving either one of the heaters disposed on the first side along

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with the heater disposed on the second side to generate the first and second bubbles; wherein the driving circuit drives the heaters selectively so that each of the nozzles is capable of ejecting droplets of different sizes.” It is these limitations found in each of the claims, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kwon et al (US Pat 6244690 B1) discloses an apparatus for jetting ink using a magnet and a plurality of coils installed on a plate to generate a magnetic field.

Imanaka et al (US Pat 6474769 B1) discloses a liquid discharge head, liquid discharge apparatus and method for manufacturing liquid discharge head.

Shimazu et al (US Pat 6331043 B1) discloses a liquid discharging method, a liquid discharge head, and a liquid discharger apparatus.

Mott (US Pat 6705716 B2) discloses a thermal ink jet printer for printing an image on a receiver and method of assembling the printer.

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Lee et al (US Pat 6439691 B1) discloses a bubble-jet type ink-jet printhead with double heater.

Leu et al (US Pat 6530648 B2) disc an apparatus for using bubble as virtual valve to eject ink and fabricating method thereof.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S Liang whose telephone number is (703) 305-4754. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (703) 308-4896. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Stephen D. Meier
Primary Examiner